J'ay fait voir cela a pluſieurs de nos medecins, & apres avoir conſulté Meſſieurs les Vicaries Generaux, nous luy avons fait prendre un habit d'homme, ſous le nom d' Arnaud Malauſe; *& on va preſentement luy faire apprendre quelque metier. Il n' y avoit pas a heſiter la deſſus, parce que notre* Hermaphrodite *peut fort bien faire la fonction d' homme, & point du tout celle de femme.*

J'ay cru vous faire plaiſir de vous ecrire ce fait, qui commence deja d'etre public dans cette ville, mais qui eſt bien rare, & bien extraordinare.

Tholoſe
Decemb. 4. 1686.

Accounts of BOOKS.

I. *Hiſtoria Plantarum, ſpecies hactenus editas aliaſq; inſuper multas noviter inventas & deſcriptas complectens &c. Autore* Joanne Rajo *e* Societate Regia. *Tomus primus.* Londini, 1686 Fol. *Apud* Henricum Faithorne *R.S. Typographum; ad inſigne Roſæ in Cæmeterio D.* Pauli.

THe excellent Author of this great Work, is ſo well known for his incomparable Skill in the *Botanick* Science, and other Parts of uſeful Learning, that it will be needleſs to ſay any thing of him. The Forreign Journals having given Accounts of this Book have prevented the mentioning of many particulars, but they only ſpeaking in general, and *per ſaltum*, neglecting the Diviſions, Subdiviſions, and the Method; I ſhall therefore only confine my ſelf to thoſe Particulars.

The *Firſt Tome* contains 18 Books, to which are premiſed a *Botanick Lexicon*, or Interpretation of Terms of Art , together with an Account of moſt of the Writers that have handled the Subject of Plants. The firſt Book treats of Plants in general; as of their Roots, Stalks, Sap, Juices, their Motions, and Differences; of Gems or Buds, Leaves, Flowers, Fruits, Seeds, Clavicles or Climbers, Prickles, their Varieties, and Vegetations; of Sowing, Propagating, Cultivating, Grafting, or Inoculating; of the Tranſmutation of Plants, their Statures or Magnitudes, their Ages or Duration, their Faculties, Taſts, and Uſes, their Places, and Diviſions; of Collecting, Drying, and Preſerving them, their Chymical *Analyſis*, and their Diſeaſes.

The 2*d*. Book begins with Particulars, as the imperfect Plants, ſuch as ſeem to have no Flower or Seed; theſe are either *Submarine*; as the *Corals*, *Sponges*, *Alga's*, *Wracks*, *&c.* or Terreſtrial, as the *Muſhrooms*, and barren *Moſſes*. Or Subterraneous, as the *Truffles*; ſome of the *Fungi* and *Moſſes*, have viſible Seeds: Theſe are all ſubdivided into ſubordinate *Genera*, as the *Muſhrooms* according to their *Lamellæ*, Plates, Brims, and Caps; and as they are noxious, or eſculent; or grow upon Trees.

The 3*d*. Book contains the *Capillary* or *Acauloſe* Herbs, which bear their very minute Seeds on the backs of their Leaves, that are conſpicuous by the *Microſcope*: Theſe are ſubdivided according to their Leaves, as they are whole, entire and undivided; or variouſly cut, laciniated, pinnate, and ramoſe. Of this Kind are the *Ferns*, the *Spleenworts*, *Polypodies*, *Maiden-Hairs*, *&c.* which have nothing like a Flower.

Tbe 4*th*. Treats of ſuch Herbs as have an imperfect or ſtamineous Flower, commonly call'd *Apetaloſe*, becauſe it is not compoſed of *Petala* or tender fugacious coloured Leaves, only of a *Calyx* or Cup, of *Stamina* or Capillaments of Styles. Theſe are ſubdivided, I. into ſuch whoſe Fruits are not contiguous to their Flowers; as in *Hops*, *Hemp*, *Nettles*, *Spinache*, *Mercury*, *Palma Chriſti*, the *American*

Phy-

Phyſick -Nut, &c. II. Into ſuch that have a triquetrous, or triangular Seed, as the *Docks. Sorrels, Arſmarts, Knot-graſs, Snake-weeds.* III. Into thoſe that have round, compreſſed, and otherwiſe figured Seeds, as the *Pond-Weeds, Orraches, Sea-Purſlane,* the *Blites,* the *Amaranthi,* the *Beets,* ſome *Kali's,* &c.

The 5*th.* Book begins with thoſe that have a perfect planifolious Flower, or tender coloured *Petala,* or Leaves, that make up a compound Flower: theſe are, I. either *lacteſcent,* milky, and *pappoſe,* containing their Seeds in a *lanugo* or downy Subſtance; as the *Lettuces, Sow-thiſtles, Succorys, Hawk-weeds, Mouſe-ears, Dandelyons, Scorzonera*'s or *Viper-graſs, Goats-beard, &c.* II. Such as have ſolid Seeds without any *pappus* or *lanugo*; as *Endive, Nipple-wort,* and ſome *Succorys*; theſe are lacteſcent.

The 6*th.* Book contains the Herbs that are not Milky, and yet bear their Seeds in a downy or *pappoſe* Subſtance, ſucceeding the Flowers; theſe have either radiated, diſcoſe, and flat Flowers; as *Colts-foot,* the *Conyza*'s or *Flea-banes, Elecampane,* the *Star-worts,* the *Leopards Banes,* the *Golden Rods,* the *Stæcha*,s, the *Jacobæa*'s or *Ragworts*; or elſe the Flower is diſpoſed into a *Thyrſus* or Spike, as in the *Petaſitis* or *Butter-bur.*

The 7*th.* Is of the capitate Herbs, whoſe Flowers are *fiſtular*, and whoſe Seeds are included in a *Squamoſe Calyx* or cup, conglobated into a Head, fill'd with a *Pappus*: of this Kind are the *Blew-bottles, Saw-wort,* the *Jacea*'s or *Knap-weeds,* the great *Centory,* the great *Burr-dock,* and moſt of the *Thiſtles,* which are ſub-divided according to their Heads, Flowers, Prickles, Spots, Conſiſtence of their Leaves, *&c.*

The 8*th.* Comprehends the *Corymbiferous,* that are not *Pappoſe,* theſe have either a radiated, or a naked Flower, and are ſubdivided according to the Colours of the *Barbulæ* and *Diſcus,* and from the Figures the Flowers make; of this Tribe are the *Sun-flowers,* the *Chryſanthemum's* and *Marigolds,* the *Yarrows, Daiſies, Feverfew,* the *Lavender-cottons,*

tons, the *Tanſies*, *Wormwoods*, *Southernwoods*, *Mugworts*, *Scabioſes*, *Teaſels*, *Eringo*, the *Globe-thiſtle*, *&c.*

The 9*th*. Treats of the *Umbelliferous* Herbs, to which are premiſed ſome Herbs that are a little a Kin to the *Umbelli*, only they have a ſingle Seed ſucceeding each Flower; whereas the true *Umbelli* have two; of the firſt Kind are many *Valerians*, the *Sea Lavenders*, the *Marvel* of *Peru*, *Agrimony*, *Burnit*, *Meadow-Rue*. *Fumitory*, *&c.* The genuine *Umbelli* have *Pentapetalous* Flowers, to each of which, ſucceed two naked Seeds joined together; theſe are put under ſo many ſub-diviſions, according to the various Figures of their Seeds, and Leaves; of this *Umbelliferous* Family are the *Parſneps*, the *Fennels*, the *Angelica's*, the *Cummins Parſlys*, *Hemlocks*, *Smallage*, *Aniſeed*, *Caraways*, the *Carrots*, *Coriander*, *&c.* all which are very nicely diſtinguiſhed, and variouſly ſub-divided.

The 10*th*. Contains the *Stellate* Herbs, whoſe Leaves like a radiated *Star* embrace the Stalk; their Flowers are *Monopetalous*, tho' divided or cut into four Segments, or coloured Leaves; to each Flower there generally ſucceeds two Seeds; of this Kind are the *Madders*, the *Croſworts*, the *Ladies Bed-ſtraw*, the *Wood-roofs*, the *Cleavers* or *Gooſe-graſs*, *&c.* The ſecond *Section* of this Book, comprehends the *Aſperifolious* Herbs, whoſe Flowers are *Monopetalous*, and generally reflected at the end like a *Scorpions* Tail, yet cut into five *Margines* or *Segments*; to every one of theſe Flowers ſucceed for the moſt part four Seeds; of this Kind are the *Pulmonaria Maculoſa*, or *Sage* of *Jeruſalem*, the *Hounds-Tongues*, *Borage*, *Bugloſs*, *Alkanet*, the *Heliotropes* or *Turnſoles*, the *Gromils*, *Scorpion-graſs*, *Comfrey*, the *Honey-Worts*, &c.

The 11*th*. is of the *Verticillate* Herbs, ſo called from the Flowers embracing the ſtalk like a whirl, or wherle, the Leaves are generally placed together exactly oppoſite on the Stalk, the Flowers are *Monopetalous*, *labiated* for the moſt part or *galeated*; to each Flower ſucceeds 4 Seeds, which the *Calyx* or *Perianthium* ſerves inſtead of a Veſſel; theſe are ſubdivided according to their ſubſtance and duration, as they are *Lignous*, *Fruticoſe*, *Perennial*, and *Herbaceous*. Of this tribe are the *Sages*, the *Lavenders*, *Roſemary*, the *Hyſſops*, the *Savoury's*, *Thymes*, *Poley-mountain*, the *Germanders*, the *Mints*, *Penneroyalls*, *Vervain*, the *Majorams*, *Baſil*, the *Clarys*, *Betonys*, *Marrubiums*, *Lamiums*, *Sideritis*, *Ground-Ivy*, *Baulm*, *Calamint*, *Ground-pine*, *Bugle*, *&c.*

The 12*th*. Comprehends thoſe Herbs, to each of whoſe Flowers ſucceed more than 4 naked Seeds, whoſe number is indefinite, they being *Polyſpermous*; here we may note that Mr. *Ray* takes thoſe for naked Seeds whoſe *Follicules* or Covers (if they ſeem to have any) are not caſt off, but fall with the Seeds from the mother Plant, being not ſeparable from them. Of this family are the *Hepatica's*, the *Ranunculi*, the leſſer *Celandine*, ſome *Mallowes* and *Althæa's*, *Avens*, *Strawberries*, *Cinquefoils*, *Tormentill*, *&c.* The ſecond Section of this Book is of ſuch Herbs as have many naked Seeds, and a Flower without any *Perianthium* or *Calyx*, as the *Travellers-joy*, and ſome *Climbers*, *Dropwort*, *Meddow-ſweet*, the *Anemonies*, *Paſque-flowers*: Thoſe of the former Section having *Perianthia* or Cups about their Flowers.

The 13*th*. Is of the *Pomiferous*, and *Bacciferous* Herbs, theſe are diſtinguiſhed by the *Magnitude*, and Skins of their Fruits; the Flowers are naked, *Monopetalous*, divided into five *Margines* or *Segments*, placed on the top of the Fruit like a *Corolla* or *Umbilicus*. Of this kind are the *Gourds*, the *Pompions*, the *Coloquintida*, the *Citruls*, *Melons*, *Cucumbers*, the *Paſſion-flowers*, *&c. China*, *Bryony*, *Solomon's-ſeals*, *Solanum's* or *Nightſhades*, *Mandrakes*, *Capſicum's* or *Guinny pepper*, *Sparagus*, *Lillies* of the Vallie. &c.

The 14*th*. Contains the *Multiſiliquoſe* or *corniculated* Herbs, which after each Flower bear many Pods or horned Seed Veſſels. Of this kind are ſome *Sedums* or *Houſe-*

leeks, *Orpines*, *Peionys*, *black Hellebore*, ſome *Althæa's*, *Monks-hoods*, *Columbines*, *Larks-ſpur's*.

The 15*th*. Is of ſuch Herbs as have a uniform *Monopetalous* Flower, and beſides the *Calyx* of the Flower have a diſtinct and proper Seed Veſſel, ſuch as are the *Henbanes*, the *Tobacco's*, the *Gentians*, the *Convolvuli* or *Bind-weeds*, the *Bell-flowers*, *Throatworts*, *Rampions*, *Stramonium's* or *Thorn Apples*: The other Section is of the deform'd *Monopetalous* Herbs, both of which are ſubdivided according to the Figures and Valves of the ſeminal Veſſels, of this laſt kind are the *Butterworts*, the *Toad-flax* or *Linaria*, *Birthworts*, *Figworts*, *Foxgloves*, *Cock-combs* or *Rattles*, *Eyebrights*, *Cow-wheats*, *&c.*

The 16*th*. Treats of ſuch Herbs as have a uniform *Tetrapetalous* or four leav'd Flower with a *deciduous quadrifolious Calyx* or *Perianthium*, to which ſucceed long or broad Seed Veſſels, or ſhort ones: the firſt are *Siliquoſe*, the other *Capſular*; of theſe kinds are the *Stock-gilliflowers*, the *Wallflowers*, *Toothworts*, *Rockets*, *Muſtards*, *Cabbages*, *Colliflowers*, *Turneps*, *Radiſhes*, *Creſſes*, *Scurvigraſſes*, *&c.* all which are ſubdivided according to their various Pods, and *Capſula's*. To theſe are ſubjoyn'd many *Anomalous tetrapetalous* Herbs, or rather *Monopetalous*, their Flowers being laciniated or cut into 4 parts; of this latter kind are ſome *Veronica's* or *Speedwells*, ſome *Chickweeds*, *Brooklimes*, *Poppies*, ſome *Lyſimachiæ* or *Willow-herbs*, *Rues*, the *Spurges*, *Plantaines*, *&c*, theſe make the 17*th*. Book.

The 18*th*. and laſt Book of the firſt Tome comprehends the *Legumes* or *Papilionaceous* Herbs, whoſe Flower ſomewhat repreſents a Butterfly with expanded wings, and is properly a deform'd *Monopetalous* Flower, tho' laciniated into 4 unequal Segments. Theſe are divided I. into ſuch *Legumes* as climb, and run up ſticks, or perches, as the *Kidney Beans*, *Peaſe*, *Tares*, *Vetches*, *Lentills*, &c. II. into ſuch as have no claſpers, and doe not climb, neither are trifoliated, theſe are ſubdivided into many ſubordinate

genera,

genera, according as their Pods are ſimple and erect, as in *Lupines*, *Beans*, common *Liquorice*, *Goats-Rue*; or *echinated* and *monoſpermous*, as in *Cocks-head*; or propendent, as in the *Orobi*, *Aſtragoli* or *Heath-Peaſe*, *Chiches*; or as their Cods are included or hid in Bottles, or Veſicles, as in the *Anthyllis*; or joyned, as in ſome *Colutea's*, *Ferrum equinum*, *Ornithopodium* or *Birds-foot*; or double, containing a double Series of Seeds, as in the *Tragacanths*, &c. The III. general diviſion is into ſuch Legumes as are trifoliated, which are variouſly ſubdivided, according as their heads are thicker or thinner ſpicated; or their Pods hid in the *Calyx*, or appear out of it, or are longer, ſhorter, intorted or cochleated; of theſe kinds are all the *Trefoils*, *Hares-foot*, *Melilots*, *Fænugreek*, *Anonis* or *Reſt-Harrows Saint-foin* or *Medick-Fodder*, the *Medica's* or *Snail Trefoils*, the *Loti* which are almoſt *Pentaphyllous* or five leaved *Legumes*, the *Cytiſi* or *ſhrub Trefoils*; to theſe are ſubjoined many *anomalous ſiliquoſe* Herbs, very near a kin to the *Papilionaceous*; as ſeveral *Fumitorys*, *Acaſia's*, *Mimoſa's* or ſenſitive Plants.

So much for the general Method of this Book; as for the ſubdiviſions of each tribe, they are ſo numerous and very nice, that I could not trace and ſet them down in this account for want of room and words: therefore the Reader is referr'd for them to Mr. *Ray* himſelf, who diſcovers in every part a vaſt Memory, a quick Apprehenſion, a clear Judgment, and a long Experience.

Before we leave this Work it may bee neceſſary to note, that all the Plants confuſedly diſperſed up and down in Books, are collected and Methodically digeſted in it, together with many new ones never before publiſhed; in the Hiſtory of each Plant Mr. *Ray* obſerves this excellent Order, firſt he gives the *Etymologies*, then the *Characteriſtick* Notes of diſtinction, the beſt *Synonymous* Names, deſcriptions of all the parts, the times and places of Growth, and the uſes as well Medicinal as Mechanical.

The ſecond and laſt Tome is already far advanced in the Preſs, above 100 Sheets being work't off, and the whole will certainly be finiſhed and publiſhed by the end of this Summer; this Volume will contain the *Pentapetalous* and *Polypetalous* Herbs, the *Bulbs* and thoſe a kin to them, the *Culmiferous* and *Graminifolious*, as the *Corns*, *Graſſes*, *Reeds*, *Ruſhes*, &c. After which follows the *Anomalous* or diſorderly tribe of Herbs; and then the *Dendrology* or Hiſtory of Trees and Shrubs begins, all which will be digeſted in a new and moſt natural Method; there will alſo be a very large Appendix. As ſoon as this Volume is publiſhed a particular account ſhall be given of it; in the mean time a ſhort general Specimen of the *Dendrology* may be inſerted, containing only a few of the principal heads.

Firſt Mr. *Ray* divides the Trees into ſuch as have *caudicem ſimplicem non ramoſum*, and ſuch as have *caudicem ramoſum*: the firſt have a ſimple Stemme without any Branches, and produce but one great *Gemma* or Bud; the ſecond that are *ramoſe*, are firſt diſtinguiſhed into ſuch as have *florem a fructu diſjunctum ſeu remotum*, and ſuch as have *florem Fructui contiguum*; of the firſt ſort ſome have the Flower remote from the Fruit in the ſame Plant, and ſome *totis Plantis ſejunctum*. Of ſuch as have alſo the Flower contiguous to the Fruit, ſome have it *ſummo Fructui inſidentem*, and others *imo Fructui adnaſcentem*; of the firſt of theſe (which have for the moſt part a *Corolla* or *Umbilicus* on the top of the Fruit) ſome contain their ſeed in *Pericarpio ſeu pulpa humida*, others in *materia Sicciore*. Each of theſe may be divided according to the number of the Seeds which the Fruit contains, into thoſe that have *Fructum monococcum*, *dicoccum*, *tricoccum*, *tetracoccum*, *pentacoccum*, and *polycoccum*; after the ſame manner alſo may the other ſort which have *Florem imo Fructui adnaſcentem* be divided: there will be many other Heads, of which at large and in particular when the Work comes forth.

II. *Philoſophiæ Naturalis Principia Mathematica, Autore* Iſ. Newton Trin. Coll. Cantab. *Soc. Matheſeos Profeſſore* Lucaſiano, *&* *Societatis Regalis Sodali.* 4to. Londini. *Proſtat apud plures Bibliopolas.*

THis incomparable Author having at length been prevailed upon to appear in publick, has in this Treatiſe given a moſt notable inſtance of the extent of the powers of the Mind; and has at once ſhewn what are the Principles of Natural Philoſophy, and ſo far derived from them their conſequences, that he ſeems to have exhauſted his Argument, and left little to be done by thoſe that ſhall ſucceed him. His great skill in the old and new Geometry, helped by his own improvements of the latter, (I mean his method of *infinite Series*) has enabled him to maſter thoſe Problems, which for their difficulty would have ſtill lain unreſolved, had one leſs qualified than himſelf attempted them.

This Treatiſe is divided into three Books, whereof the two firſt are entituled *de Motu Corporum*, the third *de Syſtemate Mundi.*

The firſt begins with definitions of the Terms made uſe of, and diſtinguiſhes *Time*, *Space*, *Place* and *Motion* into abſolute and relative, real and apparent, Mathematical and vulgar: ſhewing the neceſſity of ſuch diſtinction. To theſe definitions are ſubjoyned, the Laws of Motion, with ſeveral Corollaries therefrom; as concerning the compoſition and reſolution of any direct force out of, or into any oblique forces, (whereby the powers of all ſorts of Mechanical Engines are demonſtrated:) the Laws of the reflection of Bodies in Motion after their Colliſion: and the like

Theſe neceſſary *Præcognita* being delivered, our Author proceeds to conſider the Curves generated by the compoſition of a direct impreſſed motion with a gravitation or tendency towards a Center: and having demonſtrated that in all caſes the Areas at the Center, deſcribed by a revolving Body, are proportional to the Times; he ſhews how from the Curve deſcribed, to find the Law or Rule of the decreaſe or increaſe of the Tendency or Centripetal forces (as he calls it) in differing diſtances from the Center. Of this there are ſeveral examples: as if the Curve deſcribed be a Circle paſſing through the Center of tendency; then the force or tendency towards that Center is in all points as the fift power or ſquared-cube of the diſtance therefrom reciprocally. If in the proportional Spiral, reciprocally as the cube of the diſtance. If in an Ellipſe about the Center thereof directly as the diſtance. If in any of the *Conick* Sections about the *Focus* thereof; then he demonſtrates that the *Vis Centripeta*, or tendency towards that *Focus*, is in all places reciprocally as the ſquare of the diſtance therefrom; and that according to the Velocity of the impreſſed Motion, the Curve deſcribed is an *Hyperbola*; if the Body moved be ſwift to a certain degree than a *Parabola*; if ſlower an *Ellipſe* or Circle in one caſe. From this ſort of tendency or gravitation it follows likewiſe that the ſquares of the Times of the periodical Revolutions are as the Cubes of the *Radii* or *tranſverſe Axes* of the *Ellipſes*. All which being found to agree with the *Phænomena* of the Celeſtial Motions, as diſcovered by the great Sagacity and Diligence of *Kepler*, our Author extends himſelf upon the conſequences of this ſort of *Vis centripeta*; ſhewing how to find the *Conick* Section which a Bodie ſhall deſcribe when caſt with any velocity in a given Line, ſuppoſing the quantity of the ſaid force known: and laying down ſeveral neat conſtructions to determine the Orbs,either from the *Focus* given and two points or Tangents; or without it by five points or Tangents or any number of Points and Tangents making together five. Then he ſhews how from the Time given to find the Point in a given Orb anſwering thereto; which he performs accurately in the *Parabola*,and by conciſe approximations comes as near as he pleaſes in the *Ellipſe* and *Hyperbola*: all which are Problems of the higheſt concern in Aſtronomy. Next he lays down the Rules of the perpendicular deſcent of Bodies towards the Center, particularly in the caſe where the tendency thereto is reciprocally as the ſquare of the diſtance; and generally in all other caſes, ſuppoſing a general quadrature of Curve lines: upon which ſuppoſion likewiſe he delivers a general method of diſcovering the Orbs deſcribed by a Body moving in ſuch a tendency towards a Center, increaſing or decreaſing in any given relation to the diſtance from the Center; and then with great ſubtilty he determines in all caſes the Motion of the *Apſides* (or of the Points of greateſt diſtance from the Center in all theſe *Curves*, in ſuch Orbs as are nearly Circular. Shewing the *Apſides* fixt, if the tendency be reciprocally as the ſquare of the diſtance; direct in Motion in any *Ratio* between the Square and the Cube and retrograde; if under the Square: which Motion he determines exactly from the Rule of the increaſe or decreaſe of the *Vis Centripeta*.

Next the Motion of bodies in given Surfaces is conſidered,as likewiſe the Oſcillatory Motion of Pendules, where is ſhewn how to make a *Pendulum* Vibrate always in equal times, tho' the center or point of tendency be never ſo near; to which, the Demonſtration of Mr. *Hugens de Cycloide* is but a *Corollary*. And in another Propoſition is ſhewn the Velocity in each Point, and the time ſpent in each part of the Arch deſcribed by the Vibrating Body. After this the Effects of two or more Bodies, towards each of which there is a tendency, is conſidered; and 'tis made-out that two Bodies, ſo drawing or attracting each other, deſcribe about the common center of Gravity, Curve Lines, like to thoſe they ſeem to deſcribe about one another. And of three Bodies, attracting each other, reciprocally as the Square of the diſtance between their Centers, the various Conſequences are conſidered and laid down, in ſeveral *Corollarys* of great uſe in explicating the *Phenomena* of the *Moons* Motions, the Flux and Reflux of the Sea, the Preceſſion of the *Equinoctial* Points; and the like.

This done our Author with his uſual Acuteneſs proceeds to examine into the Cauſes of this Tendency or centripetal Force, which from undoubted Arguments is ſhown to be in all the great Bodies of the Univerſe. Here he finds that if a Sphere be compoſed of an infinity of Atoms, each of which have a *Conatus accedendi ad invicem*, which decreaſes in duplicate Proportion of the Diſtance between them; then the whole *Congeries* ſhall have the like tendency towards its Center, decreaſing, in Spaces without it, in duplicate Proportion of the Diſtances from the Center; and decreaſing, within its Surface, as the diſtance from the Center directly; ſo as to be greateſt on the Surface, and nothing at the Center: and tho' this might ſuffice, yet to compleat the Argument, there is laid down a Method to determine the forces of Globes compoſed of Particles whoſe Tendencies to each other do decreaſe in any other *Ratio* of the Diſtances: Which Speculation is carryed on likewiſe to other Bodies not Spherical, whether finite or indeterminate. Laſtly is propoſed a Method of explaining the Refractions and Reflections of tranſparent Bodies from the ſame Principles; and ſeveral Problems ſolved of the greateſt Concern in the Art of *Dioptricks.*

Hitherto our Author has conſidered the Effects of compound Motions *in Mediis non reſiſtentibus*, or wherein a Body once in Motion would move equably in a direct Line, if not diverted by a ſupervening Attraction or tendency toward ſome other Body. Here is demonſtrated what would be the conſequence of a reſiſtence from a *Medium*, either in the ſimple or duplicate *Ratio* of the Velocity, or elſe between both: and to compleat this Argument is laid down a general Method of determining the denſity of the *Medium* in all places, which, with a uniform Gravity tending perpendicularly to the plain of the *Horizon*, ſhall make a *Project* move in any curve Line aſſigned; which is the 10*th. Prop. Lib.* II. Then the circular Motion of Bodies in reſiſting *Media* is determined, and 'tis ſhown under what Laws of decreaſe of Denſity, the Circle will become a proportional Spiral. Next the denſity and compreſſion of Fluids is conſidered, and the Doctrine of *Hydroſtaticks* demonſtrated; and here 'tis propoſed to the Contemplation of Natural Philoſophers, whether the ſurprizing *Phenomena* of the Elaſticity of the Air and ſome other Fluids may not ariſe from their being compoſed of Particles which flie each other; which being rather a Phyſical than Mathematical Inquiry, our Author forbears to Diſcuſs.

Next the Oppoſition of the *Medium* and its Effects on the Vibrations of the *Pendulum* is conſidered, which is followed by an Inquiry into the Rules of the Oppoſition to Bodies, as their Bulk, Shape, or Denſity may be varyed: Here with great exactneſs is an Account given of ſeveral Experiments tried with *Pendula*, in order to verify the aforegoing Speculation, and to determine the quantity of the Airs Oppoſition to Bodies moving in it.

From hence is proceeded to the undulation of Fluids, the Laws whereof are here laid down, and by them the Motion and Propagation of Light and Sound are explained. The laſt *Section* of this Book is concerning the Circular Motion of Fluids, wherein the Nature of their *Vortical* Motions is conſidered, and from thence the *Carteſian* Doctrine of the *Vortices* of the Celeſtial Matter carrying with them the Planets about the *Sun*, is proved to be alltogether impoſſible.

The III. and laſt Book is entituled *de Syſtemate Mundi*, wherein the Demonſtrations of the two former Books are applyed to the Explication of the principal *Phenomena* of Nature: Here the verity of the *Hypotheſis* of *Kepler* is demonſtrated; and a full Reſolution given to all the difficulties that occur in the *Aſtronomical* Science; they being nothing elſe but the neceſſary conſequences of the *Sun*, *Earth*, *Moon*, and *Planets*, having all of them a gravitation or tendency towards their Centers proportionate to the Quantity of Matter in each of them, and whoſe Force abates in duplicate proportion of the Diſtance reciprocally. Here likewiſe are indiſputably ſolved the Appearances of the Tides, or Flux and Reflux of the Sea; and the Spheroidical Figure of the *Earth* and *Jupiter* determined, (from which the preceſſion of the Equinoxes, or rotation of the Earths Axis is made out,) together with the retroceſſion of the *Moons* Nodes, the Quantity and inequalities of whoſe Motion are here exactly ſtated *a priore*: Laſtly the Theory of the Motion of Comets is attempted with ſuch ſucceſs, that in an Example of the great Comet which appeared in 168$\frac{0}{1}$, the Motion thereof is computed as exactly as we can pretend to give the places of the primary Planets; and a general Method is here laid down to ſtate and determine the *Trajectoriæ* of Comets, by an eaſy Geometrical Conſtruction; upon ſuppoſition that thoſe Curves are *Parabolic*, or ſo near it that the *Parabola* may ſerve without ſenſible Error; tho' it be more probable, ſaith our Author, that theſe Orbs are *Elliptical*, and that after long periods Comets may return again. But ſuch *Ellipſes* are by Reaſon of the immenſe diſtance of the *Foci*, and ſmallneſs of the *Latus Rectum*, in the Parts near the Sun where Comets appear, not eaſily diſtinguiſhed from the Curve of the *Parabola*: as is proved by the Example produced.

The whole Book is interſperſed with *Lemma's* of General uſe in *Geometry*, and ſeveral new Methods applyed,

which

which are well worth the conſidering; and it may be juſtly ſaid, that ſo many and ſo Valuable *Philoſophical Truths*, as are herein diſcovered and put paſt Diſpute, were never yet owing to the Capacity and Induſtry of any one Man.

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Whereas the Publication of theſe Tranſactions *has for ſome Months laſt paſt been interrupted; The Reader is deſired to take notice that the care of the Edition of this Book of Mr.* Newton *having lain wholly upon the Publiſher (wherein he conceives he hath been more ſerviceable to the Commonwealth of Learning) and for ſome other preſſing reaſons, they could not be got ready in due time; but now they will again be continued as formerly, and come out regularly, either of three ſheets, or five with a Cutt; according as Materials ſhall occur.*

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